

Docket No. YOR920030340US1

REMARKS

The present patent application was filed on October 15, 2003 with claims 1-48. Claims 12-48 were withdrawn from consideration in response to a previous restriction requirement. Therefore, claims 1-11 are being presented for examination on the merits.

5 In the present Office Action, the Examiner rejected claims 1-8 and 10-11 under 35 U.S.C. §102(b) as being anticipated by Sakaguchi et al. (U.S. Patent No. 6,306,729) and rejected claim 9 under 35 U.S.C. §103(a) as being unpatentable over Sakaguchi et al..

Independent Claim 1

10 Independent claim 1 was rejected under 35 U.S.C. §102(b) as being anticipated by Sakaguchi et al. In particular, the Examiner asserts that Sakaguchi discloses a carrier substrate (11) having a porous region (13, 33, 43) with a tuned porosity in combination with a species (doped) positioned therein defining a separation plane in the carrier substrate. The Examiner further asserts that the term "implanted" is method recitation in a device claimed and that, even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product  
15 itself. The Examiner asserts that Sakaguchi discloses the porous region is doped by diffusion, ion implantation or epitaxial growth.

Applicants note that Sakaguchi teaches a doped layer 12 (col. 3, lines 40-48, and col. 18, lines 44-52). Sakaguchi teaches that the "*porous layer 13* that operates as a separation layer shows a *uniform dopant concentration.*" (Col. 4, lines 19-22; emphasis added.) Independent claim 1  
20 emphasizes that the carrier substrate has a porous region with a tuned porosity in combination with *an implanted species* positioned therein defining a separation plane in the carrier substrate.

First, Applicants assert that the "implanted species" limitation in claim 1 is a valid limitation for a structure claim, notwithstanding the Examiner's position in the original Office Action. The Examiner asserts that the "implanted species" limitation is a method recitation in a device and that  
25 the patentability of a product does not depend on its method of production. Applicants submit that the "implanted species" limitation in claim 1 is not a method recitation nor merely an indication of the method of production. Rather, as discussed more fully below, the "implanted species" limitation clearly defines a *characteristic* of the structure itself. As such, the "implanted species" limitation is a valid limitation for a structure claim.

30 Applicants further submit that the "implanted species" limitation more particularly points out and distinctly claims the invention, consistent with Section 112. The scope and meaning of the

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"implanted species" limitation is well defined and well understood by a person of ordinary skill in the art.

As indicated above, the "implanted species" limitation clearly defines a *characteristic* of the structure itself. The present disclosure teaches, for example, that

5 double-implantation layer techniques may comprise the following steps. A first implantation with boron is performed, followed by a second implantation with a group IVB species, such as silicon. The second implantation is targeted to implant a thinner region than the first implantation to create a sharp interface definition.

10 Activation of the boron implant by annealing is performed followed by anodization of the silicon to create the two regions of different porosity. An important aspect of the techniques provided herein is that to obtain various porosities, the anodization process does not have to be altered, i.e., the whole anodization process is performed at the same conditions (one anodization step). *Another benefit is that well controlled tunability of the process is accomplished by varying the amount, i.e., dose and the position, i.e., depth of the implanted ions, providing needed stability of this bi-layer during further decal processing, but at the same time, enabling easy separation when release process is required.* This well controlled tunability is essential to enable the structure to withstand the various processing steps required for the formation of the device, interconnect and packaging structures in the decal layer while it is still supported on the carrier substrate.

20 (Page 8, line 15, to page 9, line 4; emphasis added.)

This characteristic is not shown or suggested by Sakaguchi et al. As well understood by a person of ordinary skill, an implantation of a species into a carrier substrate creates a unique distribution of the species in the substrate. For example, implantation infers that the species is positioned at certain locations within the substrate (e.g., the species has a Gaussian distribution); doping does not provide for positioning a species at certain locations within the doped region. The degree of porosity (i.e., the "tuned porosity") tracks this distribution. In other words, the porosity is tuned in accordance with the implantation profile. The implantation defines the separation plane. In other words, the separation plane in the carrier substrate is defined by having a porous region with a tuned porosity in combination with an implanted species positioned therein, as set forth in claim 1. Sakaguchi, alternatively, teaches a uniform distribution with characteristics that are defined by the doping process.

25 Thus, Sakaguchi et al. do not disclose or suggest a "carrier substrate having a porous region with a tuned porosity in combination with an implanted species positioned therein defining a separation plane in the carrier substrate," as required by claim 1. As such, reconsideration and withdrawal of the rejections is thus respectfully requested.

35 Given the above remarks, Applicants respectfully submit the all the pending claims, i.e., claims 1-11, are in condition for allowance and such favorable action is earnestly solicited.

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If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The Examiner's attention to this matter is appreciated.

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Respectfully submitted,



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